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AN AEROSOL DATA BASE FORMAT.(U)
SEP 81 G L TRUSTY, K M HAUGHT
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AN AEROSOL DATA BASE FORMAT

INTRODUCTION

From past measurements we have a collection of aerosol-particle size distributions from sites that are coastal, open-sea, and inland. Because different field operations had different data requirements and because we learned as we went along, all the data in the collection were not in the same format. This made comparisons between data from different locations difficult because we had to customize the analysis computer programs for each set of data.

We reached a point where something had to be done to alleviate that situation. This report describes our solution to the problem—an aerosol standard format into which we have put all our data sets. This standard format allows us to use the same computer programs for analysis of all data sets.

We have sent the format description to British, Canadian and Australian representatives of JAG-9 of The Technical Cooperation Program. To facilitate data exchange, they have agreed to use this format as well.

The following information on our standard aerosol file structure is in four parts. First, a description of the parameters involved; second, a sample file; third, a program segment which can process the file; and fourth, an assortment of sample outputs from various programs that access the standard-format files.

FILE DESCRIPTION

The file in Figure 1 can be divided into two subheadings. First is a header section which gives information about what is to be found in the file. The second section contains the data. In the file these two sections are, however, contiguous. Note that each line/record has 80 characters maximum so the file is card compatible.

Manuscript submitted July 10, 1981.

The first line in the file header in Figure 2 gives the program name which created the file (or another heading if that is not the case) and the date of creation. The date is always stored in the same format so that it can be accessed by program.

The second line in the file header tells what is to be found in the rest of the header and in the data. The number of lines in the header and the data sets are determined by the values of the parameters in this line, i.e., not all files will contain the same amount of information but this line allows the same program to access the different files.

In the parameter description below the four-digit numbers refer to the FORMAT line numbers found in the sample program in Figure 3.

FILE HEADER

9010

SITE	20-Character name of experiment.
NATRH	Number of air temperature-relative humidity pairs. 0 through 2. See 9060.
NWSWD	Number of windspeed-wind direction pairs. 0 through 2. See 9060.
NPROBE	Number of particle counters. 0 through 8. 15 channels per probe. See 9020 and 9070.
NSUMS	Value of 0 or 1 which designates whether the total number, cross section, and volume values for the distribution are included. 0 means they are not included.

NMIE	Number of wavelengths at which calculated aerosol extinctions are given. See 9040.
SPARES	Four-character names of spare channels. See 9060. Six available.

9020

PROBES	Eight-character names of probes, e.g., ASAS-1, CSAS-2. Up to eight probes. Can indicate different ranges also.

9030

EDGES	Locations of the bin edges of the probes. Sixteen edges assumed. Zeros indicate no further edges. Values are for radius in micrometers.

9040

MIEW	Wavelengths at which aerosol extinctions are calculated. Values are in micrometers. Maximum of eleven.
MIENR	Real part of index of refraction used in extinction calculation. Correspond to values above.
MIENI	Imaginary part of index of refraction as above.

DATA

9050

NYEAR	Integer value of (Year-1900).
NDAY	Numerical day of the year.
NTIME	Hour of day (e.g., 1320). At the *end* of period for averaged data.
MINAVG	Length of averaging time for the entry in minutes. Usual values are: 60, 30, 15, 12, 10, 6, 5, 4, 3, 2, and 1.
SECAVG	Length of averaging time for entry in seconds. Will be nonzero only if averaging time is less than *one minute*.

9060

AT1, DP1 AT2, DP2	Air temperature and dewpoint at locations 1 and 2 in degrees Celsius.
WS1, WS2	Windspeeds in meters/second.
WD1, WD2	Wind direction in compass degrees.
SC1, SC2, SC3 SC4, SC5, SC6	Spare channels for miscellaneous pertinent data.
PPW1, PPW2	Partial pressure of water vapor in torr. (From DP or AT and RH.)
RH1, RH2	Relative humidity in percent.

9070

DNDR	Particle size distribution values from particle counter. Fifteen channels, NPROBE probes. Particles/cm^3/μm.

9080

TNUM	Total number density given by the distribution. Particles per cc.
TAREA	Total geometric cross section presented by the distribution. μm^2/cm^3.
TVOL	Total volume density of particles in the distribution. μm^3/cm^3.

NOTE: These last three values can have meaning only if the DN/DR values form a single valued distribution. I.E. multirange results which overlap must be handled somehow.

9040

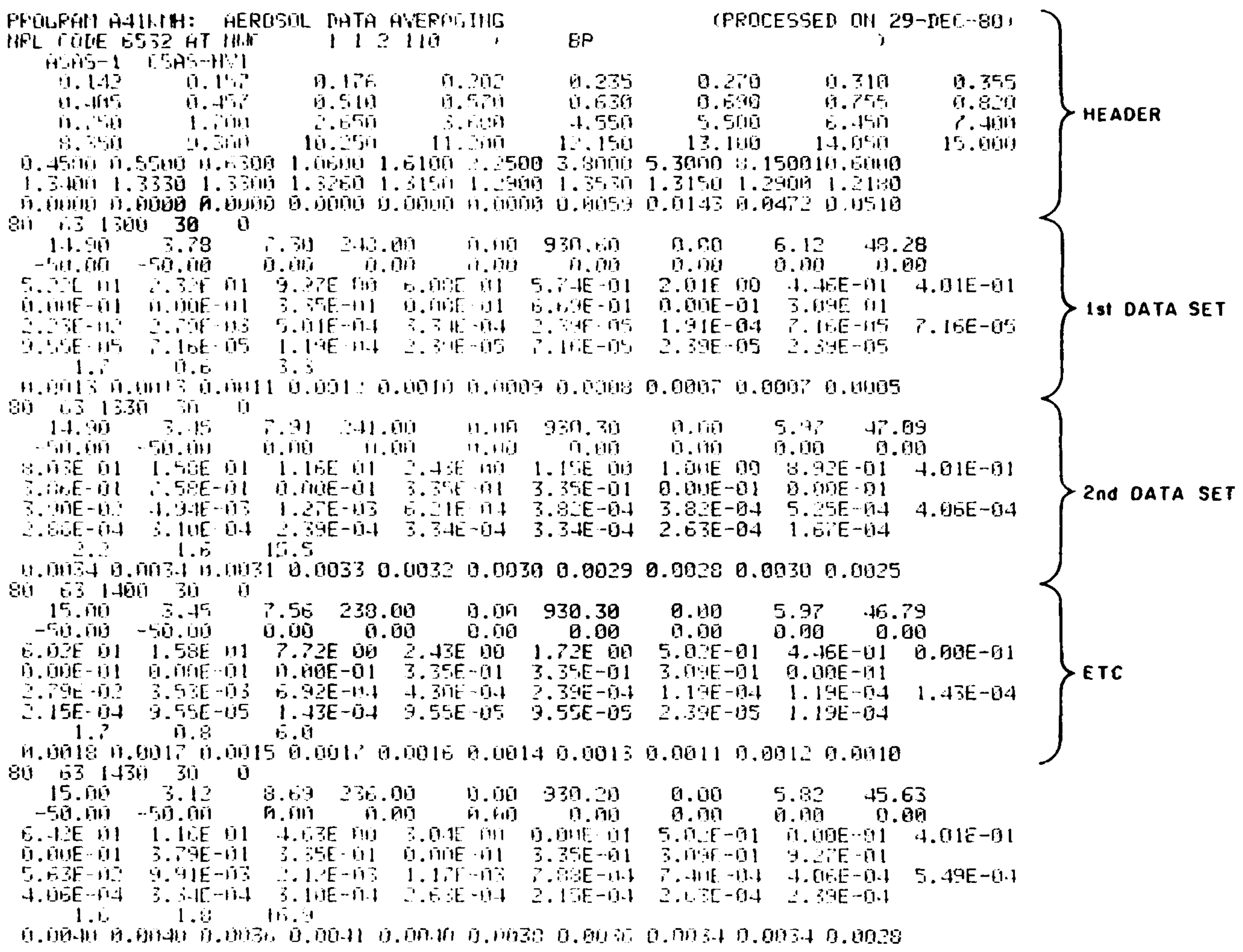
MIEEXT	Calculated values of aerosol extinction coefficients in km^{-1} or the wavelengths given in MIEW. The note above pertains.

PROGRAM SEGMENT

The segment of a Fortran program in Figure 3 reads a file and writes a new file. We include it here to assure proper format structure.

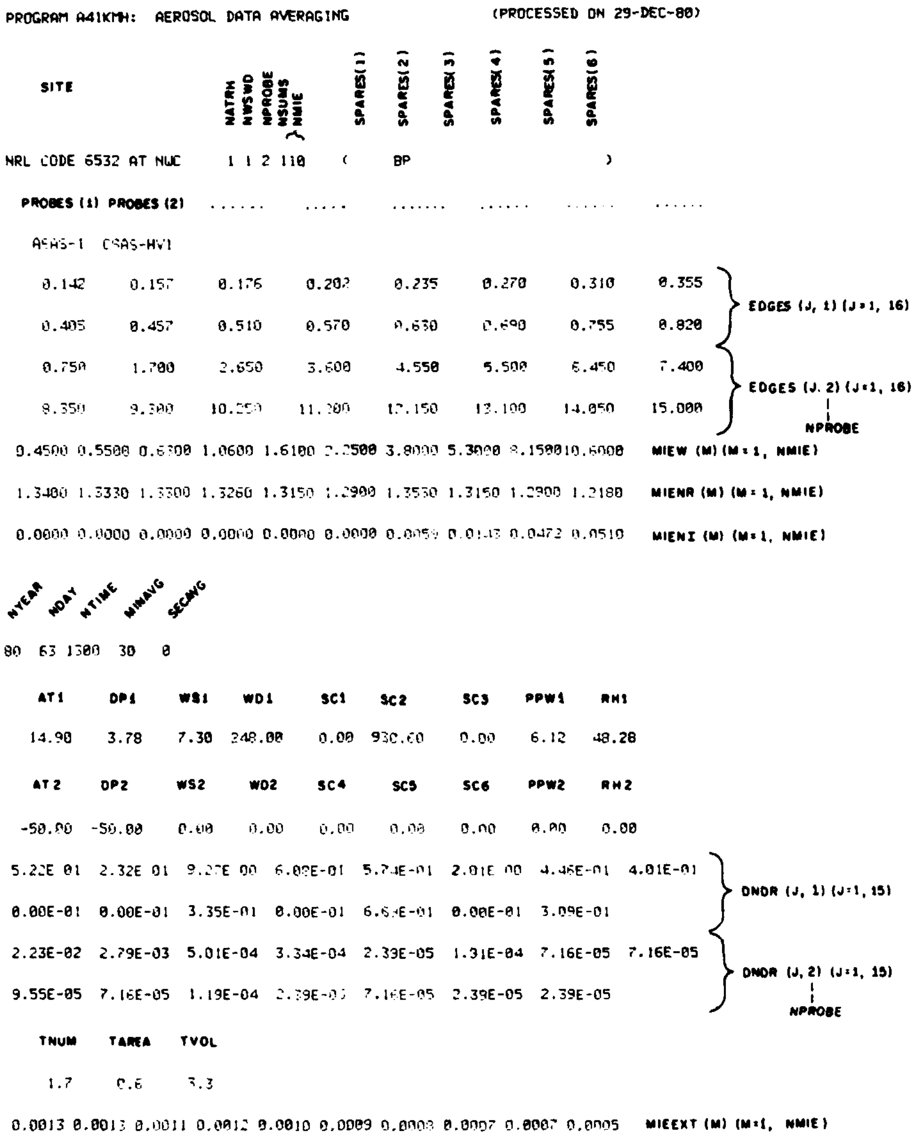
SAMPLE OUTPUTS

Figures 4 through 7 give sample outputs from some of the programs that access the files.



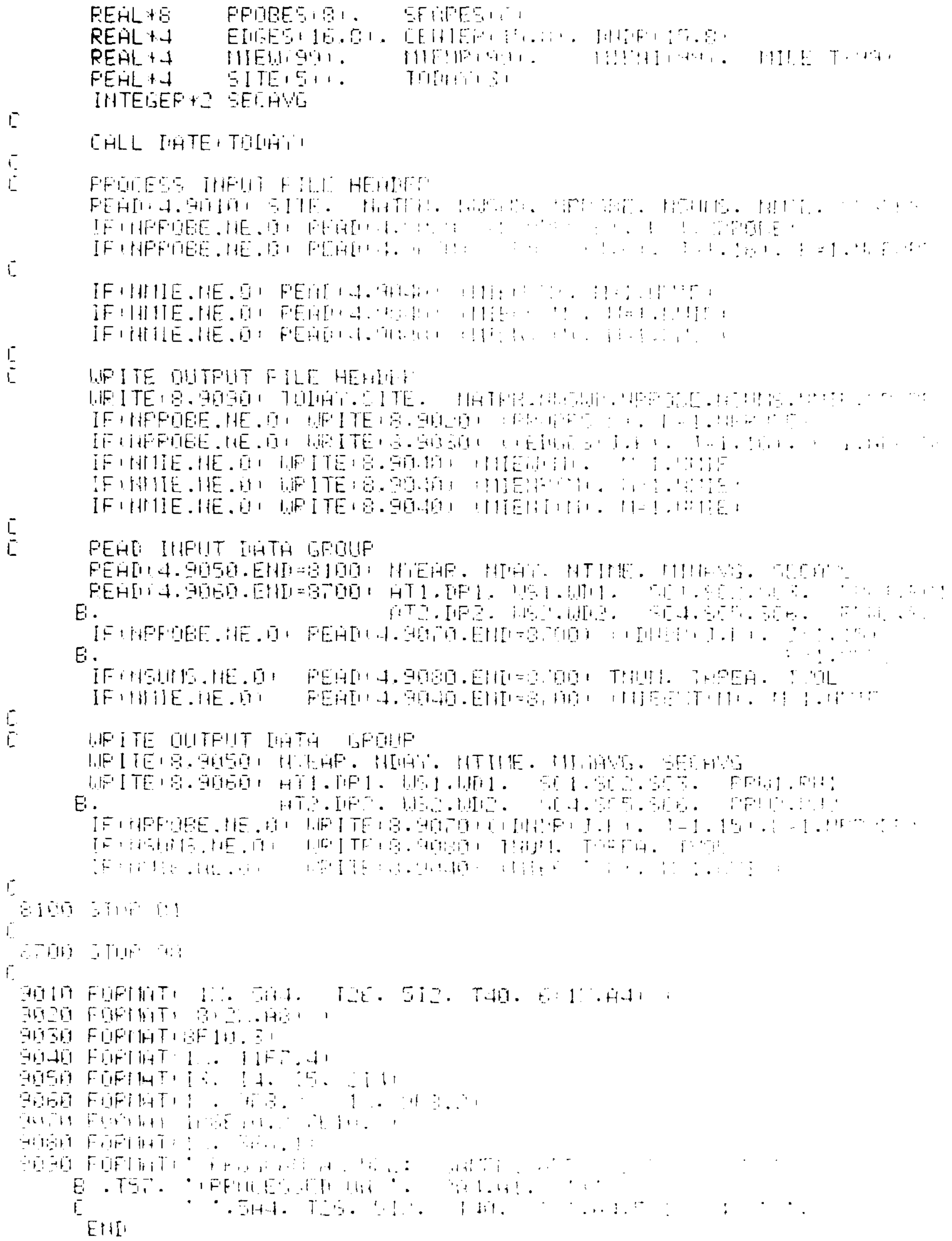
```
PROGRAM A41NMH:  AERDSOL DATA AVERAGING                (PROCESSED ON 29-DEC-80)
NRL CODE 6532 AT NMF      1 1 2 110    ,      BP                       )
   ASAS-1  CSAS-HV1
    0.142      0.157      0.176      0.202      0.235      0.270      0.310      0.355
    0.405      0.457      0.510      0.570      0.630      0.690      0.755      0.820
    0.750      1.700      2.650      3.600      4.550      5.500      6.450      7.400
    8.350      9.300     10.250     11.200     12.150     13.100     14.050     15.000
 0.4500 0.5500 0.6300 1.0600 1.6100 2.2500 3.8000 5.3000 8.150010.6000
 1.3400 1.3330 1.3300 1.3260 1.3150 1.2900 1.3530 1.3150 1.2900 1.2180
 0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0059 0.0143 0.0472 0.0510
80  63 1300  30   0
   14.90     3.78     7.30  243.00     0.00  930.60     0.00     6.12   48.28
  -50.00  -50.00     0.00    0.00     0.00    0.00     0.00     0.00    0.00
 5.22E 01  2.32E 01  9.27E 00  6.00E 01  5.74E-01  2.01E 00  4.46E-01  4.01E-01
 0.00E-01  0.00E-01  3.35E-01  0.00E-01  6.69E-01  0.00E-01  3.09E 01
 2.23E-02  2.70E-03  5.01E-04  3.34E-04  2.39E-05  1.91E-04  7.16E-05  7.16E-05
 9.55E-05  7.16E-05  1.19E-04  2.39E-05  7.16E-05  2.39E-05  2.39E-05
     1.7       0.6       3.3
 0.0013 0.0013 0.0011 0.0012 0.0010 0.0009 0.0008 0.0007 0.0007 0.0005
80  63 1330  30   0
   14.90     3.45     7.91  241.00     0.00  930.30     0.00     5.97   47.09
  -50.00  -50.00     0.00    0.00     0.00    0.00     0.00     0.00    0.00
 8.03E 01  1.58E 01  1.16E 01  2.43E 00  1.15E 00  1.00E 00  8.92E-01  4.01E-01
 3.06E-01  2.58E-01  0.00E-01  3.35E-01  3.35E-01  0.00E-01  0.00E-01
 3.90E-02  4.94E-03  1.27E-03  6.21E-04  3.82E-04  3.82E-04  5.25E-04  4.06E-04
 2.86E-04  3.10E-04  2.39E-04  3.34E-04  3.34E-04  2.63E-04  1.67E-04
     2.2       1.6      15.5
 0.0034 0.0034 0.0031 0.0033 0.0032 0.0030 0.0029 0.0028 0.0030 0.0025
80  63 1400  30   0
   15.00     3.45     7.56  238.00     0.00  930.30     0.00     5.97   46.79
  -50.00  -50.00     0.00    0.00     0.00    0.00     0.00     0.00    0.00
 6.02E 01  1.58E 01  7.72E 00  2.43E 00  1.72E 00  5.02E-01  4.46E-01  0.00E-01
 0.00E-01  0.00E-01  0.00E-01  3.35E-01  3.35E-01  3.09E-01  0.00E-01
 2.79E-02  3.53E-03  6.92E-04  4.30E-04  2.39E-04  1.19E-04  1.19E-04  1.43E-04
 2.15E-04  9.55E-05  1.43E-04  9.55E-05  9.55E-05  2.39E-05  1.19E-04
     1.7       0.8       6.0
 0.0018 0.0017 0.0015 0.0017 0.0016 0.0014 0.0013 0.0011 0.0012 0.0010
80  63 1430  30   0
   15.00     3.12     8.69  236.00     0.00  930.20     0.00     5.82   45.63
  -50.00  -50.00     0.00    0.00     0.00    0.00     0.00     0.00    0.00
 6.42E 01  1.16E 01  4.63E 00  3.04E 00  0.00E-01  5.02E-01  0.00E-01  4.01E-01
 0.00E-01  3.79E-01  3.35E-01  0.00E-01  3.35E-01  3.09E-01  9.27E-01
 5.63E-02  9.91E-03  2.12E-03  1.17E-03  7.88E-04  7.40E-04  4.06E-04  5.49E-04
 4.06E-04  3.34E-04  3.10E-04  2.63E-04  2.15E-04  2.63E-04  2.39E-04
     1.6       1.8      16.9
 0.0040 0.0040 0.0036 0.0041 0.0040 0.0038 0.0036 0.0034 0.0034 0.0028
```

Fig. 1 — File structure



```
PROGRAM A41KMH:  AEROSOL DATA AVERAGING                    (PROCESSED ON 29-DEC-80)

    SITE              NATRM NWSWD NPROBE NSUMS NMIE   SPARES(1)  SPARES(2)  SPARES(3)  SPARES(4)  SPARES(5)  SPARES(6)

NRL CODE 6532 AT NWC    1 1 2 110        (         BP                                     )

  PROBES (1) PROBES (2)  ......     .....     .......     ......     ......     ......

   ASAS-1  CSAS-HV1

    0.142     0.157     0.176     0.202     0.235     0.270     0.310     0.355  \
                                                                                  > EDGES (J, 1) (J=1, 16)
    0.405     0.457     0.510     0.570     0.630     0.690     0.755     0.820  /

    0.750     1.700     2.650     3.600     4.550     5.500     6.450     7.400  \
                                                                                  > EDGES (J, 2) (J=1, 16)
    8.350     9.300    10.250    11.200    12.150    13.100    14.050    15.000  /        |
                                                                                        NPROBE
  0.4500 0.5500 0.6300 1.0600 1.6100 2.2500 3.8000 5.3000 8.150010.6000    MIEW (M) (M=1, NMIE)

  1.3400 1.3330 1.3300 1.3260 1.3150 1.2900 1.3530 1.3150 1.2900 1.2180    MIENR (M) (M=1, NMIE)

  0.0000 0.0000 0.0000 0.0000 0.0000 0.0000 0.0059 0.0143 0.0472 0.0510    MIENI (M) (M=1, NMIE)

NYEAR NDAY NTIME MINAVG SECAVG

80  63 1300  30   0

   AT1      DP1     WS1     WD1       SC1     SC2       SC3     PPW1     RH1

   14.90    3.78    7.30  248.00     0.00   930.60     0.00     6.12    48.28

   AT2      DP2     WS2      WD2      SC4      SC5      SC6     PPW2     RH2

  -50.00  -50.00    0.00     0.00     0.00     0.00     0.00     0.00     0.00

  5.22E 01  2.32E 01  9.27E 00  6.09E-01  5.74E-01  2.01E 00  4.46E-01  4.01E-01  \
                                                                                    > DNDR (J, 1) (J=1, 15)
  0.00E-01  0.00E-01  3.35E-01  0.00E-01  6.64E-01  0.00E-01  3.09E-01            /

  2.23E-02  2.79E-03  5.01E-04  3.34E-04  2.39E-05  1.31E-04  7.16E-05  7.16E-05  \
                                                                                    > DNDR (J, 2) (J=1, 15)
  9.55E-05  7.16E-05  1.19E-04  2.39E-05  7.16E-05  2.39E-05  2.39E-05            /         |
                                                                                          NPROBE
   TNUM     TAREA    TVOL

    1.7      0.6      3.3

  0.0013 0.0013 0.0011 0.0012 0.0010 0.0009 0.0008 0.0007 0.0007 0.0005   MIEEXT (M) (M=1, NMIE)
```

Fig. 2 — Header structure



```
      REAL*8     PROBES(8).   SFRPES([illegible])
      REAL*4     EDGES(16.8). CENTER([illegible]). DNDR(15.8)
      REAL*4     MIEW(99).    MIEMP(99).    [illegible].  MILE T[illegible]
      REAL*4     SITE(5).     TODAY(3)
      INTEGER*2 SECAVG
C
      CALL DATE(TODAY)
C
C     PROCESS INPUT FILE HEADER
      READ(4.9010) SITE.  NATER. NWGS. NPROBE. NSUMS. NMIE. [illegible]
      IF(NPROBE.NE.0) READ(4.[illegible] [illegible]PROBE)
      IF(NPROBE.NE.0) READ(4.[illegible] J=1.16). I=1.N[illegible]
C
      IF(NMIE.NE.0) READ(4.9040) (MIEW(N). N=1.NMIE)
      IF(NMIE.NE.0) READ(4.9040) (MIEMP(N). N=1.NMIE)
      IF(NMIE.NE.0) READ(4.9040) (MIE[illegible](N). N=1.NMIE)
C
C     WRITE OUTPUT FILE HEADER
      WRITE(8.9090) TODAY.SITE.  NATER.NWGS.NPROBE.NSUMS.[illegible]
      IF(NPROBE.NE.0) WRITE(8.9020) (PROBES(I). I=1.NPROBE)
      IF(NPROBE.NE.0) WRITE(8.9030) ((EDGES(J.I). J=1.16). I=1.N[illegible]
      IF(NMIE.NE.0) WRITE(8.9040) (MIEW(N). N=1.NMIE)
      IF(NMIE.NE.0) WRITE(8.9040) (MIEMP(N). N=1.NMIE)
      IF(NMIE.NE.0) WRITE(8.9040) (MIENI(N). N=1.NMIE)
C
C     READ INPUT DATA GROUP
      READ(4.9050.END=8100) NYEAR. NDAY. NTIME. MINAVG. SECAVG
      READ(4.9060.END=8700) AT1.DP1. WS1.WD1.  SC1.SC2.SC3.  [illegible]
     B.                     AT2.DP2. WS2.WD2.  SC4.SC5.SC6.  [illegible]
      IF(NPROBE.NE.0) READ(4.9070.END=8700) ((DNDR(J.I). J=1.15)[illegible]
     B.                                                  [illegible]
      IF(NSUMS.NE.0)  READ(4.9080.END=8700) TNUM. TAREA. TVOL
      IF(NMIE.NE.0)   READ(4.9040.END=8700) (MIE[illegible](N). N=1.NMIE)
C
C     WRITE OUTPUT DATA  GROUP
      WRITE(8.9050) NYEAR. NDAY. NTIME. MINAVG. SECAVG
      WRITE(8.9060) AT1.DP1. WS1.WD1.  SC1.SC2.SC3.  PRW1.PH1
     B.              AT2.DP2. WS2.WD2.  SC4.SC5.SC6.  PRW2.PH2
      IF(NPROBE.NE.0) WRITE(8.9070)((DNDR(J.I). J=1.15).I=1.N[illegible]
      IF(NSUMS.NE.0)  WRITE(8.9080) TNUM. TAREA. TVOL
      IF(NMIE.NE.0)   WRITE(8.9040) (MIE[illegible](N). N=1.NMIE)
C
 8100 STOP 01
C
 8700 STOP [illegible]
C
 9010 FORMAT( 1X. 5A4.  T26. 5I2. T40. 6(1X.A4) )
 9020 FORMAT( 8(2X.A8) )
 9030 FORMAT(8F10.3)
 9040 FORMAT(1X. 11F7.4)
 9050 FORMAT(I[illegible]. I4. I5. 2I4)
 9060 FORMAT(1X. 4F8.[illegible]  1X. 4F8.2)
 9070 FORMAT(1X8E10.[illegible])
 9080 FORMAT(1X. 3E[illegible])
 9090 FORMAT(' [illegible]
     B .T57. '(PROCESSED ON '. [illegible]
     C         ' '.5A4. T25. 5I2. T40. [illegible]
      END
```

Fig. 3 — Program segment

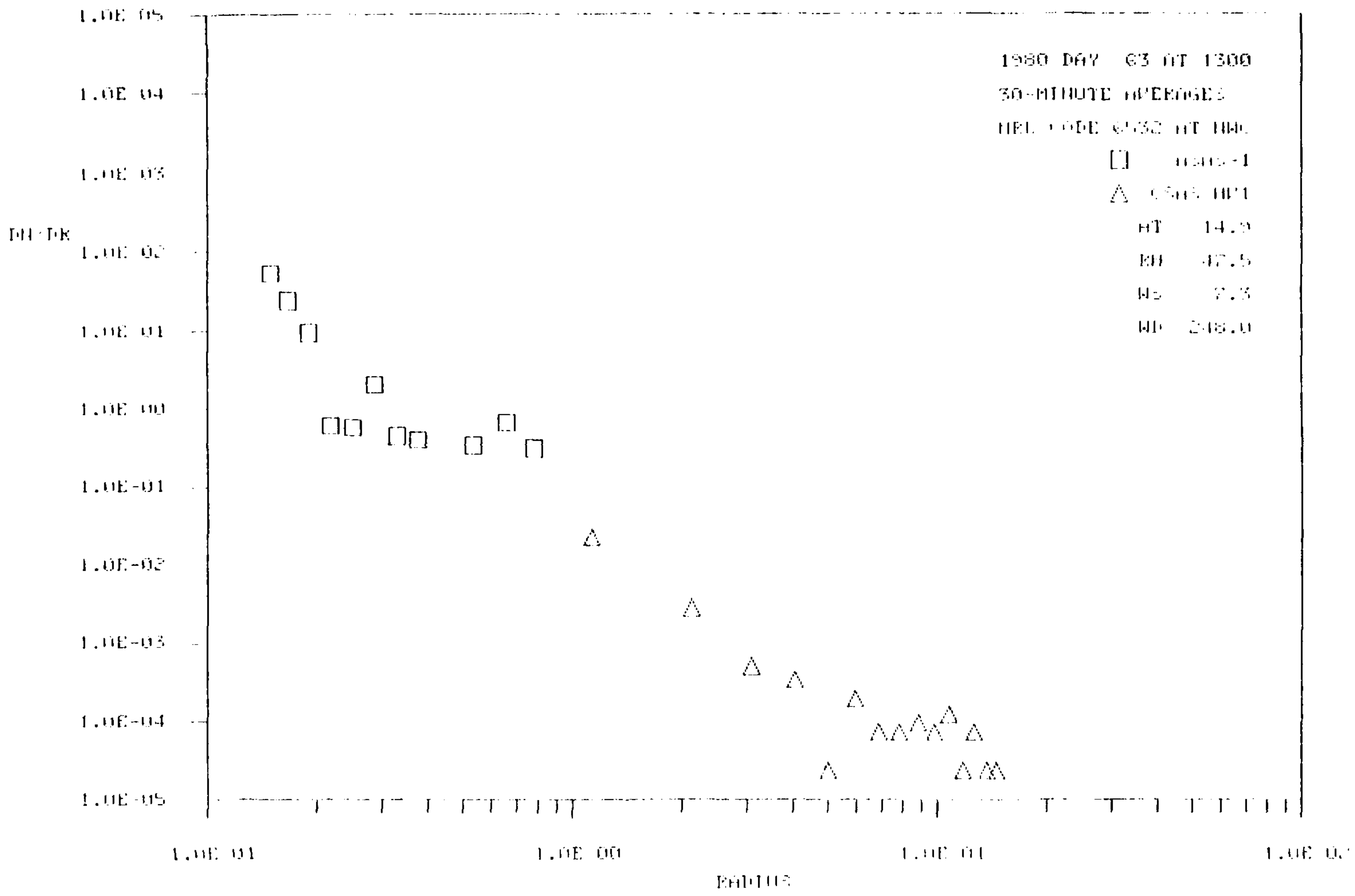


Fig. 4a — Sample A42NRL output. Particle size distribution

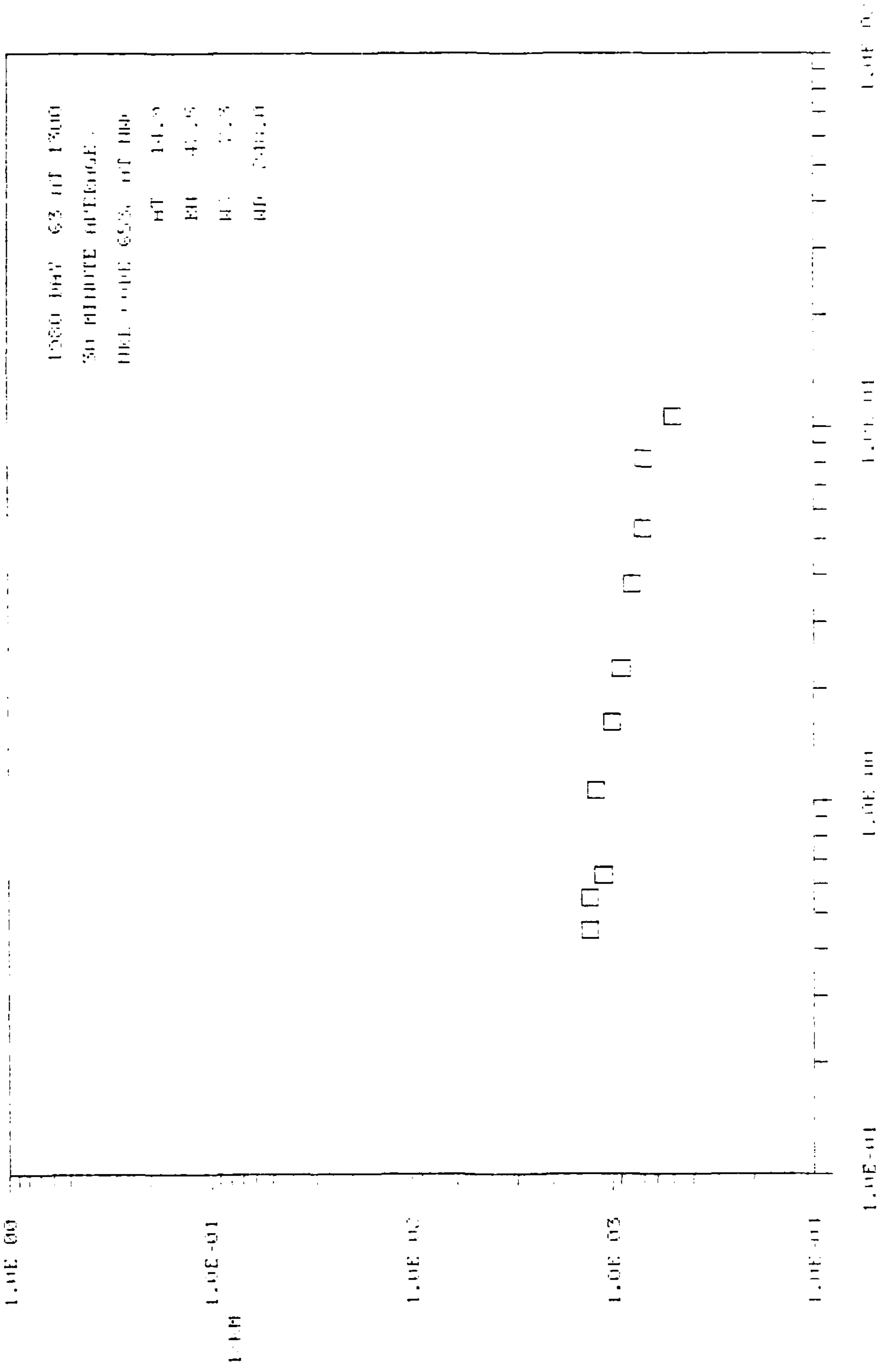


Fig. 4b — Sample A42NRL output. Aerosol extinction vs wavelength

```
PROGRAM A48NRL:  AEROSOL/MET DATA TABULATION              (PROCESSED ON 24-JUN-81)

NRL CODE 6532 AT NWC
YEAR DAY TIME     AT       RH      WS      WD    WVP     NUM     AREA      VOL                EXTINCTION  (1/KM)
                                  (M/S)          (TORR)  (1/CC)           (UM3/CC)    0.55      1.06      3.80      10.6

 80   63 1300    14.9     47.5     7.3     248    6.0     2.      0.6       3.3      0.001     0.001     0.0008    0.0005
         1400    15.0     46.1     7.6     238    5.9     2.      0.8       6.0      0.002     0.002     0.0013    0.0010
         1600    14.4     48.2     8.2     224    5.9     1.      0.8       5.4      0.002     0.002     0.0014    0.0009

 80   64 1800    15.3     33.5     2.4     129    4.4     3.      0.8       1.6      0.002     0.002     0.0007    0.0002
         1900    13.2     40.9     2.5      98    4.7     5.      0.9       1.1      0.002     0.001     0.0005    0.0001
         2000    12.5     46.0     2.5     120    5.0     8.      1.3       2.3      0.002     0.002     0.0008    0.0003
         2100    11.8     48.4     1.6     116    5.0    10.      1.4       1.5      0.002     0.002     0.0007    0.0002
         2200    10.7     51.7     1.9     106    5.0    14.      2.3       2.9      0.004     0.003     0.0012    0.0003

 80   66 1900     6.9     69.2     2.5  [illegible] 5.2   1.      0.3       0.4      0.001     0.001     0.0002    0.0000
         2000     8.1     49.3     3.0  [illegible] 4.0   1.      0.5       1.4      0.001     0.001     0.0005    0.0002
         2100     7.8     46.4     5.6  [illegible] 3.7   1.      0.5       1.6      0.001     0.001     0.0005    0.0002
         2200     7.1     51.5     5.1     220    3.9     1.      0.6       1.1      0.001     0.001     0.0004    0.0001
         2300     6.6     53.5     5.3     222    3.9     2.      0.7       0.8      0.002     0.002     0.0005    0.0001

 80   67 1900     8.6     63.5     0.9     100    5.3     8.      2.6       6.0      0.006     0.005     0.0024    0.0008
         2000     8.3     61.2     0.5  [illegible] 5.0  12.      3.2       7.8      0.006     0.006     0.0026    0.0011
         2100     8.3     59.7     1.1     171    4.9    39.      9.0      15.9      0.018     0.014     0.0061    0.0020
         2200     6.3     73.1     1.5     156    5.2    63.     15.4      20.3      0.032     0.027     0.0084    0.0021
         2300     5.6     79.8     0.1     262    5.5    64.     16.6      20.7      0.035     0.030     0.0092    0.0020

 80   70 1400    15.4     32.6     1.3  [illegible] 4.3   5.      1.0       1.3      0.002     0.002     0.0006    0.0001
         1600    15.2  [illegible] 2.6     251    4.7     7.      1.5       2.6      0.003     0.003     0.0012    0.0003
         1700    11.0  [illegible] [illegible] [illegible] 4.7 7. [illegible] 1.3   0.004     0.004     0.0018    [illegible]
         1800    12.7     47.1     1.3     267    5.2     8.      1.7       3.5      0.003     0.003     0.0015    0.0004
         1900    11.3     58.8     0.8     266    5.9    11.      2.1       3.9      0.004     0.003     0.0016    0.0005
         2000    10.9     63.9     1.8     170    6.2    14.      2.8       4.7      0.005     0.005     0.0023    0.0005
         2100    10.7     65.7     1.1  [illegible] 6.3  19.      3.7       5.1      0.007     0.006     0.0024    0.0005
         2200    10.3     68.3     0.4  [illegible] 6.4  17.      3.4       4.2      0.006     0.006     0.0022    0.0004
         2300    10.4     65.2     1.3     129    6.2    16.      3.1       4.1      0.005     0.005     0.0020    0.0004

 80   71    0    10.1  [illegible] 1.1  [illegible] [illegible] 13. [illegible] [illegible] 0.004 0.004  0.0015    [illegible]

 80   72 1800    14.7  [illegible] 1.1     101  [illegible] 11.     6.1      18.5      0.014     0.015  [illegible] [illegible]
         1900  [illegible] [illegible] 0.9 [illegible] [illegible] 16. [illegible] [illegible] 0.018 0.018 [illegible] [illegible]
         2000    11.9  [illegible] 1.4  [illegible] [illegible] [illegible] [illegible] 14.8 [illegible] 0.014 [illegible] [illegible]
         2100    10.7  [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] 14.9 [illegible] [illegible] 0.0024 [illegible]
         2200  [illegible] [illegible] [illegible] 101 [illegible] [illegible] 10.8 [illegible] [illegible] [illegible] [illegible] [illegible]
         2300  [illegible] [illegible] [illegible] 101 [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

 80   73    0  [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
```

Fig. 5 — Sample of A48NRL output

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PROGRAM A49NRL:  AEROSOL DISTRIBUTION TABULATION        (PROCESSED ON 24-JUN-81)

NRL CODE 6532 AT NWC
  RADIUS --->    0.15        0.17        0.19        0.22        0.25        0.29        0.33        1.23        2.18        3.12        4.08

  80    63 1300  5.22E 01    2.32E 01    9.27E 00    6.08E-01    5.74E-01    2.01E 00    4.46E-01    2.23E-02    2.79E-03    5.01E-04    3.34E-04
           1400  6.02E 01    1.58E 01    7.72E 00    2.43E 00    1.72E 00    5.02E-01    4.46E-01    2.79E-02    3.53E-03    6.92E-04    4.30E-04
           1600  2.01E 01    7.40E 00    3.86E 00    6.08E-01    0.00E-01    1.00E 00    0.00E-01    4.12E-02    6.56E-03    1.43E-03    [illegible]

  80    64 1800  9.48E 01    [illegible] [illegible] [illegible] 1.14E 00    5.01E-01    8.90E-01    5.01E-02    5.28E-03    7.16E-04    1.19E-04
           1900  1.79E 02    6.43E 01    3.54E 01    7.89E 00    1.72E 00    1.00E 00    4.45E-01    4.87E-02    3.68E-03    4.06E-04    7.16E-05
           2000  2.42E 02    9.59E 01    5.85E 01    8.50E 00    6.30E 00    1.00E 00    4.45E-01    [illegible] 6.13E-03    9.79E-04    3.10E-04
           2100  2.99E 02    1.12E 02    7.09E 01    1.58E 01    5.72E 00    3.51E 00    4.45E-01    6.27E-02    6.23E-03    8.59E-04    [illegible]
           2200  3.77E 02    [illegible] [illegible] [illegible] 1.37E 01    3.51E 00    2.23E 00    8.58E-02    9.33E-03    1.74E-03    [illegible]

  80    66 1900  2.31E 01    9.51E 00    5.98E 00    7.60E-01    4.30E-01    2.51E-01    0.00E-01    2.31E-02    1.53E-03    1.19E-04    7.16E-05
           2000  3.75E 01    1.24E 01    6.56E 00    1.06E 00    1.58E 00    6.27E-01    2.23E-01    3.73E-02    2.58E-03    5.49E-04    1.91E-04
           2100  3.68E 01    1.03E 01    6.18E 00    1.98E 00    1.43E 00    3.76E-01    2.23E-01    4.75E-02    2.43E-03    2.86E-04    3.55E-05
           2200  3.55E 01    [illegible] 1.00E 01    2.13E 00    2.29E 00    6.27E-01    5.58E-01    5.09E-02    3.10E-03    1.91E-04    7.16E-05
           2300  6.69E 01    2.30E 01    1.20E 01    3.19E 00    2.29E 00    1.00E 00    7.81E-01    6.79E-02    3.13E-03    3.10E-04    9.55E-05

  80    67 1900  2.24E 02    7.84E 01    5.35E 01    1.31E 01    7.31E 00    5.34E 00    3.57E 00    1.70E-01    1.42E-02    2.91E-03    9.55E-04
           2000  2.88E 02    [illegible] 1.05E 02    2.31E 01    1.42E 01    7.15E 00    3.46E 00    1.08E-01    1.31E-02    2.39E-03    9.79E-04
           2100  8.81E 02    4.08E 02    3.51E 02    9.87E 01    5.64E 01    2.90E 01    1.19E 01    4.47E-01    3.20E-02    7.97E 03    2.74E-03
           2200  1.36E 03    6.23E 02    5.43E 02    1.56E 02    9.89E 01    5.68E 01    2.40E 01    9.68E-01    4.77E-02    7.69E-03    2.39E-03
           2300  1.31E 03    6.44E 02    5.65E 02    1.81E 02    9.69E 01    5.41E 01    2.70E 01    1.12E 00    5.29E-02    1.02E-02    2.17E-03

  80    70 1400  1.50E 02    [illegible] [illegible] 6.24E 00    2.58E 00    1.25E 00    1.12E 00    5.56E-02    6.06E-03    8.83E 04    2.15E-04
           1600  2.22E 02    7.00E 01    4.23E 01    7.76E 00    4.45E 00    3.26E 00    1.56E 00    8.80E-02    1.03E-02    1.48E-03    [illegible]
           1700  2.48E 02    8.45E 01    4.07E 01    7.45E 00    3.87E 00    2.26E 00    1.12E 00    1.24E-01    1.43E-02    2.36E-03    4.30E-04
           1800  2.74E 02    1.08E 02    4.73E 01    7.30E 00    2.58E 00    1.76E 00    3.35E-01    1.05E-01    1.20E-02    1.89E-03    6.44E-04
           1900  3.47E 02    1.33E 02    6.72E 01    1.00E 01    4.88E 00    2.26E 00    1.45E 00    1.10E-01    1.17E-02    1.65E-03    6.21E-04
           2000  4.57E 02    [illegible] [illegible] 1.64E 01    5.88E 00    2.76E 00    7.81E-01    1.79E-01    1.82E-02    3.13E-03    8.83E-04
           2100  5.81E 02    2.35E 02    1.26E 02    2.07E 01    1.03E 01    4.77E 00    3.35E 00    2.27E-01    2.12E-02    2.39E 03    6.44E-04
           2200  4.92E 02    2.16E 02    1.18E 02    2.40E 01    1.08E 01    4.89E 00    2.01E 00    2.29E-01    2.15E-02    2.51E-03    5.35E-04
           2300  4.64E 02    2.11E 02    1.10E 02    1.89E 01    1.15E 01    5.65E 00    1.45E 00    2.01E-01    1.82E-02    2.32E-03    5.01E-04

  80    71    0  4.26E 02    [illegible] [illegible] 1.41E 01    7.31E 00    3.14E 00    1.12E 00    1.62E-01    1.60E-02    1.40E-03    2.86E-04

  80    72 1800  3.02E 02    1.19E 02    [illegible] 1.70E 01    6.88E 00    3.51E 00    2.34E 00    4.86E-01    7.18E-02    1.33E-02    4.65E-03
           1900  [illegible] [illegible] [illegible] [illegible] 1.09E 01    [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
           2000  [illegible] [illegible] [illegible] [illegible] 1.58E 01    [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]
           2100  1.27E 03    [illegible] [illegible] [illegible] 2.47E 01    1.03E 01    [illegible] [illegible] [illegible] [illegible] [illegible]
           2200  1.40E 03    [illegible] [illegible] [illegible] [illegible] 1.12E 01    5.91E 00    [illegible] [illegible] [illegible] [illegible]
           2300  1.44E 03    [illegible] [illegible] [illegible] 2.94E 01    1.08E 01    [illegible] 7.08E-01    1.14E-01    [illegible] [illegible]

  80    73    0  2.12E 03    9.21E 02    6.83E 02    1.37E 02    5.82E 01    2.46E 01    1.03E 01    6.21E-01    5.65E-02    6.25E-03    [illegible]
```

Fig. 6 — Sample of A49NRL output

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PROGRAM A49NRL:  AEROSOL DISTRIBUTION TABULATION        (PROCESSED ON 24-JUN-81)

NRL CODE 6532 AT NWC
  RADIUS --->       5.03        5.97        6.93        7.88        8.83        9.78       10.73       11.68       12.63       13.58       14.53

  80    63 1300  2.39E-05  1.91E-04  7.16E-05  7.16E-05  9.55E-05  7.16E-05  1.19E-04  2.39E-05  7.16E-05  2.39E-05  2.39E-05
           1400  2.39E-04  1.19E-04  1.19E-04  1.43E-04  2.15E-04  9.55E-05  1.43E-04  9.55E-05  9.55E-05  2.39E-05  1.19E-04
           1600  2.15E-04  [illegible]  [illegible]  1.43E-04  9.55E-05  1.67E-04  9.55E-05  9.55E-05  4.77E-05  7.16E-05  4.77E-05

  80    64 1800  7.16E-05  4.77E-05  7.16E-05  2.39E-05  2.39E-05  2.39E-05  7.16E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01
           1900  4.77E-05  4.77E-05  4.77E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01  0.00E-01
           2000  1.91E-04  1.43E-04  7.16E-05  4.77E-05  0.00E-01  0.00E-01  2.39E-05  2.39E-05  0.00E-01  4.77E-05  0.00E-01
           2100  1.43E-04  7.16E-05  7.16E-05  0.00E-01  4.77E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01
           2200  2.39E-04  9.55E-05  9.55E-05  7.16E-05  4.77E-05  4.77E-05  0.00E-01  2.39E-05  2.39E-05  0.00E-01  0.00E-01

  80    66 1900  2.39E-05  2.39E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01
           2000  4.77E-05  4.77E-05  2.39E-05  2.39E-05  2.39E-05  0.00E-01  2.39E-05  2.39E-05  0.00E-01  0.00E-01  2.39E-05
           2100  1.19E-04  7.16E-05  0.00E-01  2.39E-05  0.00E-01  2.39E-05  4.77E-05  0.00E-01  0.00E-01  4.77E-05  0.00E-01
           2200  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01  2.39E-05  0.00E-01
           2300  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01

  80    67 1900  5.49E-04  3.10E-04  2.39E-04  1.43E-04  1.19E-04  2.86E-04  2.39E-05  2.39E-05  0.00E-01  2.39E-05  0.00E-01
           2000  5.49E-04  4.06E-04  1.91E-04  1.91E-04  7.16E-05  1.67E-04  7.16E-05  9.55E-05  4.77E-05  7.16E-05  4.77E-05
           2100  1.41E-03  1.12E-03  5.49E-04  5.73E-04  2.63E-04  1.19E-04  2.15E-04  9.55E-05  1.19E-04  2.39E-05  0.00E-01
           2200  9.31E-04  5.49E-04  4.30E-04  3.82E-04  1.19E-04  3.58E-04  7.16E-05  7.16E-05  0.00E-01  7.16E-05  2.39E-05
           2300  1.03E-03  6.92E-04  1.91E-04  2.86E-04  1.19E-04  1.19E-04  0.00E-01  1.19E-04  2.39E-05  0.00E-01  4.77E-05

  80    70 1400  9.55E-05  2.39E-05  2.39E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01  0.00E-01  0.00E-01
           1600  3.58E-04  1.67E-04  0.00E-01  0.00E-01  4.77E-05  4.77E-05  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01
           1700  4.06E-04  2.63E-04  1.43E-04  1.19E-04  7.16E-05  4.77E-05  4.77E-05  2.39E-05  0.00E-01  2.39E-05  2.39E-05
           1800  2.86E-04  1.91E-04  1.43E-04  7.16E-05  7.16E-05  2.39E-05  2.39E-05  4.77E-05  2.39E-05  0.00E-01  0.00E-01
           1900  2.63E-04  1.91E-04  1.67E-04  7.16E-05  4.77E-05  7.16E-05  2.39E-05  2.39E-05  7.16E-05  0.00E-01  0.00E-01
           2000  5.73E-04  [illegible]  1.43E-04  9.55E-05  1.19E-04  7.16E-05  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01
           2100  1.91E-04  1.19E-04  1.19E-04  1.43E-04  2.39E-05  4.77E-05  2.39E-05  0.00E-01  4.77E-05  0.00E-01  0.00E-01
           2200  1.91E-04  9.55E-05  7.16E-05  2.39E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  2.39E-05  0.00E-01
           2300  1.19E-04  1.19E-04  7.16E-05  7.16E-05  2.39E-05  2.39E-05  4.77E-05  2.39E-05  0.00E-01  0.00E-01  0.00E-01

  80    71    0  4.77E-05  4.77E-05  4.77E-05  2.39E-05  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01  0.00E-01

  80    72 1800  2.27E-03  [illegible]  [illegible]  [illegible]  2.39E-04  1.19E-04  2.15E-04  1.19E-04  9.55E-05  2.39E-05  7.16E-05
           1900  3.08E-03  [illegible]  [illegible]  [illegible]  3.34E-04  3.10E-04  2.15E-04  1.43E-04  1.43E-04  1.19E-04  2.39E-05
           2000  9.31E-04  [illegible]  [illegible]  [illegible]  2.86E-04  1.19E-04  7.16E-05  4.77E-05  4.77E-05  7.16E-05  0.00E-01
           2100  1.12E-03  [illegible]  [illegible]  [illegible]  3.10E-04  1.19E-04  7.16E-05  0.00E-01  4.77E-05  0.00E-01  0.00E-01
           2200  2.27E-03  [illegible]  [illegible]  [illegible]  4.30E-04  1.67E-04  2.86E-04  9.55E-05  7.16E-05  4.77E-05  0.00E-01
           2300  2.58E-03  [illegible]  [illegible]  [illegible]  1.91E-04  2.15E-04  1.91E-04  7.16E-05  9.55E-05  2.39E-05  2.39E-05

  80    73    0  6.44E-04  [illegible]  1.67E-04  2.15E-04  1.43E-04  1.19E-04  7.16E-05  7.16E-05  7.16E-05  4.77E-05  2.39E-05
```

Fig. 6 (Continued) — Sample of A49NRL output

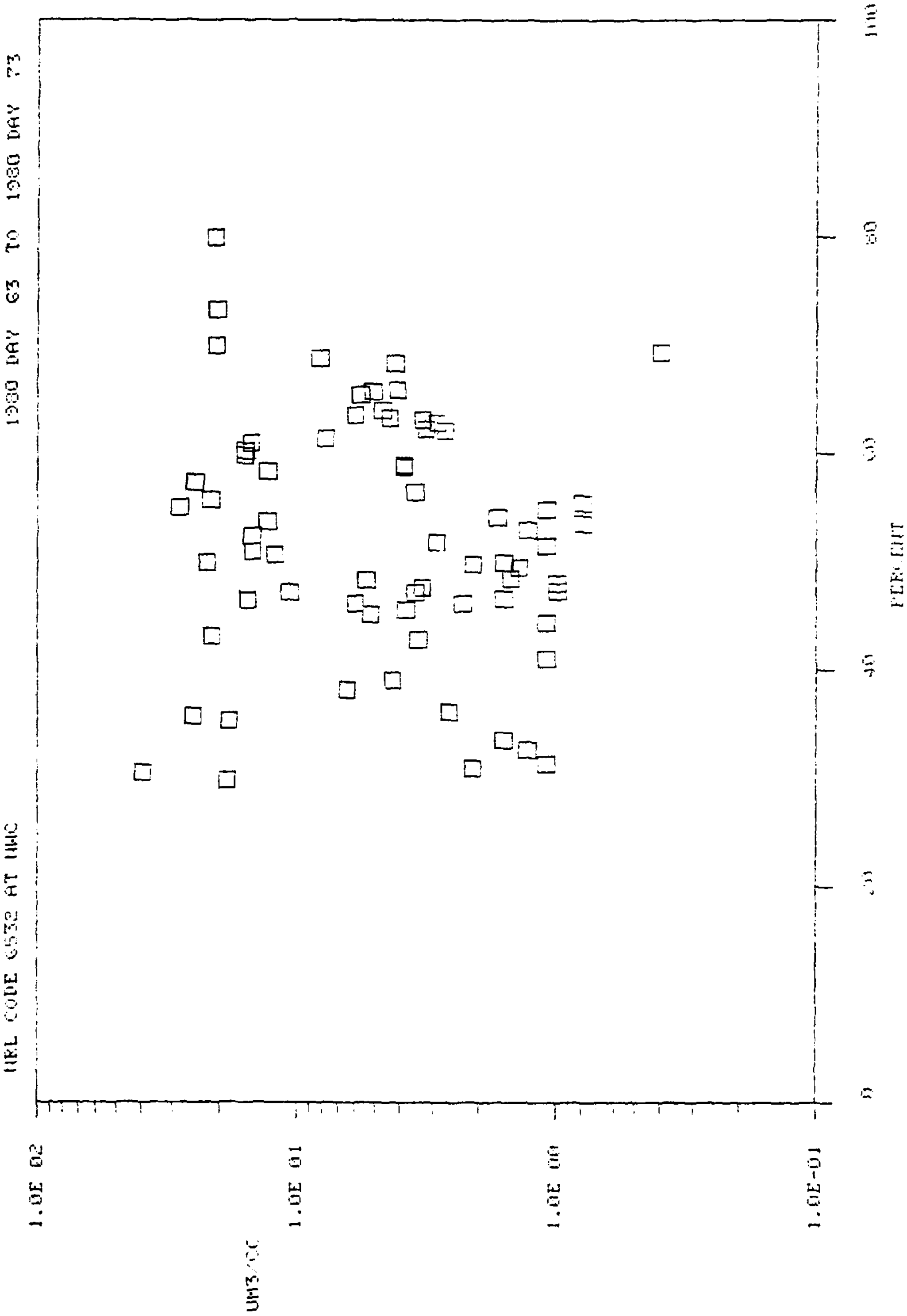

Fig. 7a — Sample of AS2NRL output. Total volume density vs relative humidity

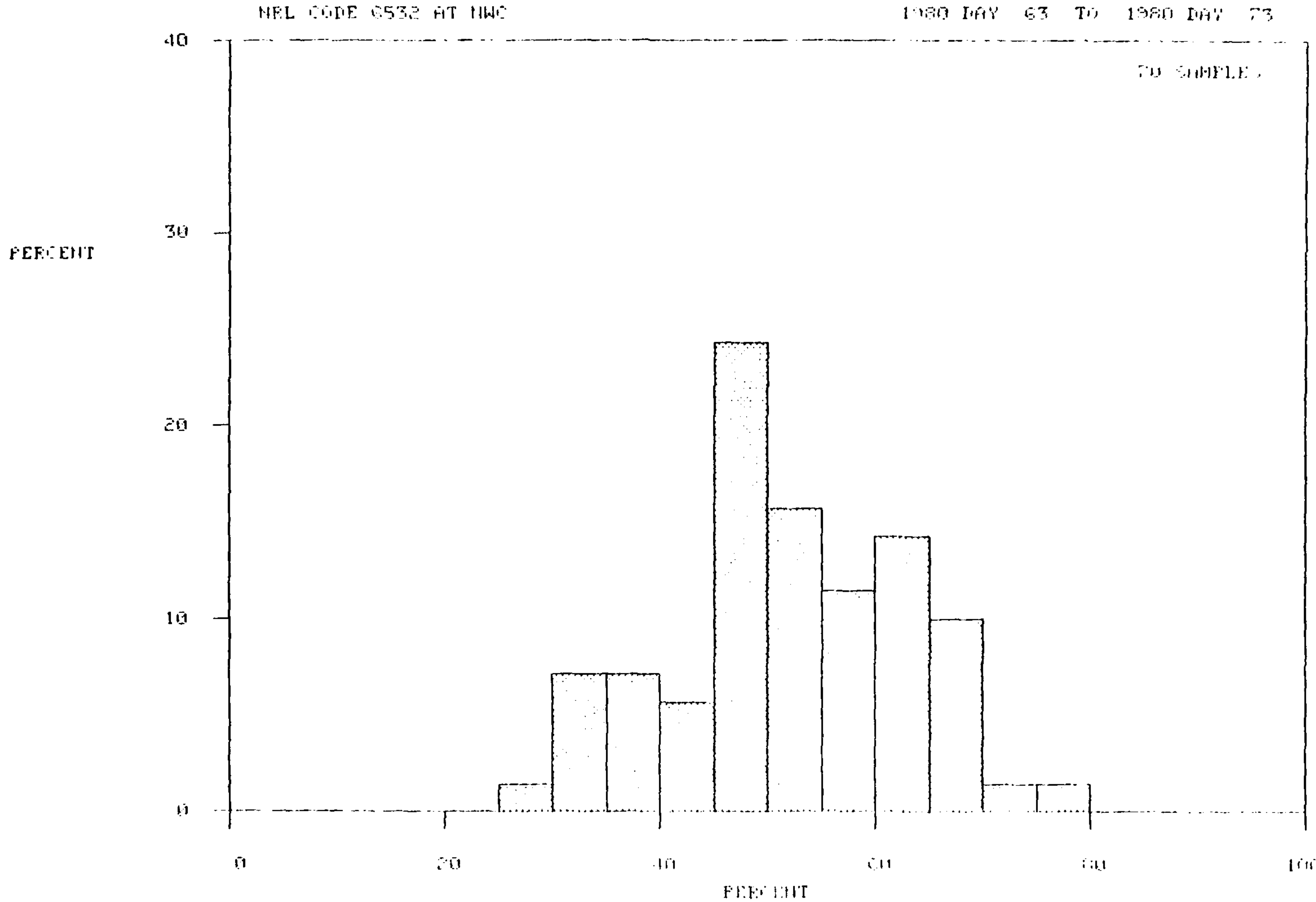

Fig. 7b — Sample A52NRL output. Frequency of occurrence of relative humidity

DA
FILM